THE ORIGIN AND DESTINY OF MAN

by

René Ravenel Snowden

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THE ORIGIN AND DESTINY OF MAN

IN TWO VOLUMES

VOLUME I

The Origin of Man

Evolution from a New Angle

BY

RENÉ RAVENEL SNOWDEN

Member of American Chemical Society
Member of American Association for the Advancement of Science

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DEDICATED

To all sincere seekers after Truth

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PREFACE

This book is, primarily, intended to be an accurate statement of scientific truth with reasonable deductions therefrom; while another important feature is an effort to make its statements clear to the general reader. In order that just appraisals may be assured, judgment should be withheld until all the evidence "is in"; that is, till the whole of the book shall have been read and understood.

The reader will be generous to its shortcomings, since it has been produced under great difficulties. In a busy life, it had to be written almost wholly while sitting in railroad cars and waiting rooms, and during short periods available at home. This indulgence, however, should not touch its conclusions, since these, in the interest of truth, must be subjected to the severest criticism.

INTRODUCTION

In the search for truth a condition precedent to success is that the seeker must be willing, if necessary, to temporarily abandon his most cherished beliefs; for truth is inexorable, and sometimes makes stern demands.

The conclusions presented herein, when not the result of positive and direct knowledge, are predicated upon strong presumptive evidence.*

It is the author's object and hope to place the controversy between religionists and scientists before his readers in a new light, which seems to him to illuminate the subject, even to the extent of harmonizing many of their supposed differences.

It is self evident that truth cannot conflict with truth, and whenever there is disagreement, one set of arguments is untrue. The apparent conflict of the Biblical record of creation with science is due mainly to two causes, namely; on the one hand a narrow or false interpretation of the Scripture; and on the other the incompleteness of evidence and the frequent use of hypotheses as real evidence on the part of the scientists. Therefore, the evidence on both sides must be subjected to the established rules of criticism and interpretation. On the part of Genesis: (1) The original

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*"Presumptions of Law consist of those rules which in certain cases either forbid or dispense with any ulterior inquiry. They are founded either upon the first principles of justice, or *laws of nature*, or the experienced cause of human conduct and affairs, and the connections usually found to exist between certain things. . . . . . Thus the malicious intent to kill, from the deliberate use of a deadly weapon, and the presumption of aquatic habits in an animal found with webbed feet belong to the same philosophy, differing only in instance and not in principle of its application. The one fact being proved or ascertained, the other, its uniform concomitant, is universally and safely presumed."—LAWS OF EVIDENCE by *Simon Greenleaf*.

language of the Bible narrative must be correctly translated; (2) the changes in modes of expression since the record was written must be allowed for; and (3) a certain peculiarity of prophecy belonging as well to retrospective psychic vision, must be recognized. Prophetic vision, whether prospective or retrospective, compasses the entire range of events and objects within its scope, ignoring the time factor entirely; just as in dreams we associate quite recent acquaintances with others as children long since grown to manhood, while conscious of no inconsistencies. Jesus, having foretold the destruction of the Temple, was asked by His disciples, "When shall these things be?" In His reply He combined an extended reference to the *end of the world* with the much earlier occurrence, and added, "*This generation shall not pass away till all be fulfilled.*" (The reader will please make a mental note of this italicized statement of Jesus', since an important reference will be made to it later on.) So also, the retrospective vision of the seer compassed the whole scope of man's existence whatever its nature and throughout all of the time necessary for the changes recorded. On the part of science: the dicta of the latter should not be trusted unreservedly until there is adequate proof of their truth. Too often supposed scientific "facts" have had to be revised or even discarded.*

The author does not presume to be able to harmonize all differences between science and Genesis, nor to explain all mysteries connected with the subject, but aspires merely to point out some startling relations of certain accepted facts; and while adopting the positive style of presentation, it must not be inferred that he claims more than reasonable plausibility for some of his conclusions, which are herewith submitted to the judgment of his readers. He does claim, however, a basis in science for such conclusions.

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*For instance, one of the foundations of science has been the supposed permanence of the so-called elements; and this foundation has recently been rudely shattered by the conversion of the supposed element tungsten—a heavy metal—into helium and other gases; and by the spontaneous decomposition of radium, another supposed element—into helium and lead.

It is sought to show that science supports a number of Biblical statements which hitherto have been considered irreconcilable with accepted facts, among which are these:

Proposition No. 1.—The breath of life was breathed into the inanimate—Man.

Proposition No. 2.—For a time after life appeared on the earth there was no death, which later entered.

Proposition No. 3.—Death came as a result of man's action.

Proposition No. 4.—The first man's body was divided and the part separated became another individual—Woman.

Proposition No. 5.—Man was made "from the dust of the ground."

If my conclusions are true both science and Genesis support my contention that the animals as well as man die as the result of man's action. In no other way is the death of the animals accounted for.

CHAPTER I

THE SCIENTISTS AND SCIENCE

In every structure the foundation must first be laid sure and strong, then the superstructure will be secure. In our quest for the Origin of Man we have access at present to but two sources of information, namely: Science and revelation. Our first business therefore is to examine both these sources before undertaking the exploitation of them.

THE SCIENTISTS

A noble band in search of truth—
And yet in vain they preach
That man should disbelieve in all
But what his senses teach;

For all the truths that science shows,
If viewed without pretense,
But tend to prove, beyond a doubt,
The impotence of Sense.

Besides the facts, we too must know
To read the facts aright,
N'or dream there's naught beyond our ken
But nothingness and night.

For countless years men saw the sun
With reverential awe,
Rise up and cross the firmament,
Nor doubted what they saw;

Till science by her light revealed,
The course the planets run;
How earth upon her axis wheels
And circles round the sun.

—HENRY LYNDEN FLASH.

Scientists may be divided into three classes: The true scientist, who with becoming modesty, recognizes his limitations, and is willing to make any sacrifice in the interest of truth and the advancement of knowledge. The scientist of this class, with singleness of aim and unhampered by extraneous burdens, soars on eagle's wings and thus extends his horizon far beyond the limits of other men's vision, blessing the world with his discoveries and revelations.

The scientist of a lower order is deeply interested in truth, but being more or less self-centered, allows his petty partisanships and jealousies to place unfortunate and artificial limitations upon the scope of his vision.

The third grade scientist is he who seeks distinction without earning it. He is so full of himself that there is no room for anything else. This pseudo-scientist points out the alleged errors of the true scientist, and by attacking established science hopes to gain a little momentary distinction, moth-like, through fluttering close to a light; and may even, moth-like again, fly into the flame; with this difference, however, in favor of the moth—the latter loses its life, while he has nothing to lose.

The writer was once informed by one of these "*wiseacres*" that the reason the earth attracted objects to it was because *it is a vacuum!* And he could not be made to understand that the only way in which a vacuum could hold an object is by its forming one side of the vacuum. He, of course, believed there is no God, as there can be nothing greater than himself. A more typical representative of the species, besides rejecting the ideas of a God and of a soul, added that there *is no such thing as right and wrong!* The pseudo-scientist has discovered the mistakes of the highest authorities and best scholars, a few of his discoveries being the following: That Bacon wrote Shakespeare's works; someone other than Moses wrote the books of Moses; other persons wrote the Gospels than those whose names they bear; Jesus of Nazareth never lived; George Washington was a myth, and Columbus never discovered America.

This so-called scientist is unable to see in the wonderful organization and co-ordinations of nature the handiwork of a Supreme Intelligence, yet the true scientist recognizes an inscrutable first cause. Indeed, this should be the test of the true scientist, for the mind that rejects the fact of a first cause is incapable of apprehending the simplest elements of science. Reasoning from the fact that there is no effect without an adequate cause there is no escape from the conclusion of a first cause. The cause is always precedent to the effect.

The scientist who relies upon secondary causes inevitably finds himself in the predicament of the traveler in Egypt who hearing a gun announce the hour each morning and a bell ring the hour each noon, and wishing to get correct time, asked the gunner where he got his time. The reply was, from the bell in the tower at noon. Then asking the bell-ringer where he got his time, the answer was, from the gun fired at six in the morning. The true scientist therefore is careful to avoid secondary causes as final.

CHAPTER II

THE BIBLE

This chapter treats of the authority of the first two chapters of Genesis, and incidentally, of the relations between science and revelation.

Origin of the Book of Genesis

It is commonly believed—and with great certainty—that Moses gave this record of creation to the Hebrews; yet it probably had earlier been given to the world since similar references to the creation appear in the records of other and older nations. But doubtless Moses, who had access to the literature of the world as an adopted son of royalty, was guided by the Divine impulse and inspiration to select the truth from the mass of superstition with which it had become smothered. Unfortunately for Biblical students the free advance of a knowledge of truth has been hindered by the overzealous partisans of both religion and science in their bitter and often blind opposition to every claim made by their opponent that appeared to reflect adversely upon their own position; and the greater the truth of the claim the more violent the opposition to it. Certainly, the honest dissenter on either side is entitled to a respectful hearing since a necessary quality of the honest mind is the open mind—ready to be converted upon proof of error.

If the Biblical record of creation is true it must agree with the findings of *true* science, for there can be no conflict between a true Bible and true science. While it is not the object of the Bible to teach science, yet it must agree with all truth since its only claim to acceptance is based on its truth; and if the Bible is untrue it should be rejected. Nevertheless, we must not reject data from either source on superficial evidence. The statements of Genesis regarding the creation are clear and positive, as coming from one who *knows*. Let us consider these separately:

> Genesis, Chapter I: "In the beginning *God* created the heaven and the earth." (V. 1.)

Out of the mass of ridiculous philosophies, and the worship of all sorts of supposed gods, Moses pointed to the fact of *one God*, the creator of the heaven and the earth which constitute all things. And even to this day, with its astounding advancement and achievements, science has failed to discover one hint of a material cause for the material universe. No "natural" law can account for the beginning of the material universe; still scientists recognize a first cause. These accepted spokesmen for science have this to say of the Creator:

Herbert Spencer: "The unknown source of things."

Tyndall: "A power inscrutable to the human intellect."

Huxley admits that all things had a beginning but makes no attempt to account for it.

> "And the earth was without form and void." (V. 2.)

This describes the condition of the earth in the beginning with scientific accuracy when it was a portion of an immeasurable nebulous mass, which science informs us it was, for while the earth was an unseparate portion of the vast nebula it could not, in the nature of things possess form, any more than a drop of water in the ocean can have form. And this statement was made at a time antedating by many centuries any knowledge on the part of scientists of a former nebulous condition of the solar system.

> "And darkness was upon the face of the deep, and the spirit of God moved upon the face of the waters (or fluid mass), and God said, Let there be light, and there was light." (Vs. 2, 3.)

The infinite first cause from which is derived all force imparted motion to the universe of matter, and as science definitely informs us, light is the inevitable result of sufficiently violent motion.

Here, then, are three positive dicta of the sacred record, the first two of which, science positively confirms, while the other admits its impotence to criticise.

> "And God saw the light, that it was good: and God divided the light from the darkness." (V. 4.)

From the production of the nebula the light proceeded to become more and more suitable for all the purposes of light, until it was pronounced *good.*

The statement, "And God saw the light that it was good," may seem gratuitous, but scientists learned in the year 1864 that there *is* light that is *not good,* for the uses that we know for light. In that year Mr. Huggins, with the aid of the spectroscope, discovered that the light of some of the nebulae is *not good* in the sense that it does not contain all the colors of solar light, which was the light that was pronounced *good.*

> "And God called the light day, and the darkness he called night. And it was evening and it was morning, one day." (V. 5.) (Which is said to be the correct rendering.)*

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*C. B. Waring in Scribner's Monthly, No. 15, page 823.

The word "day" is in the first instance a comprehensive term, meaning all visible light, without regard to duration; while in the second it refers to a definite period of time, and yet, not the solar day of twenty-four hours, for the sun—the cause of our solar day—did not appear in the firmament until three of these cosmic days had passed. Hence, the solar day had not yet been instituted. It matters not that the same word is used in the original Hebrew for the days of creation as that used to designate the ordinary day of 24 hours. The word day, even in common usage, does not necessarily mean 24 hours, for a day on Jupiter is about 10 hours.

Now, if a day may mean any number of hours, it may mean any number of years also, however many.

For a long time the word day in the narrative was supposed to be the day of twenty-four hours, and the Biblical record was rejected on the certain testimony of science that millions of years were required to accomplish the changes indicated as having transpired during each of them.* Later

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*The author believes the enormous age formerly assigned to the solar system is far too short to express its true age. The following are his reasons for this belief: In estimating the probable age of the system two efficient causes of maintenance of the sun's heat did not enter as factors. First radium, but recently discovered, is found to exist in the sun and is constantly generating radiant energy in enormous quantity. Second: The continual conversion of the sun's energy of rotation into heat, light, magnetism and electricity has never, so far as the author can learn, been taken into consideration. In the following way a rotating fluid body generates radiant energy at the expense of its energy of rotation: It is self-evident that every portion of a rotating body considered separately rotates in the same period as the entire mass. Now, at the time the earth was separated from the sun the latter must have rotated in the same period as that of the earth. Today the earth's period of rotation is 24 hours, while that of the sun is about *27 days*. What has so reduced the sun's rotation? What has become of the sun's lost energy of rotation? The same cause has operated in a less degree in reducing the earth's rotation; therefore both sun and earth must have rotated more rapidly than the earth does now.

Now, a projectile fired at a given point near the surface of a globe—the earth for instance—at a velocity just sufficient to offset the pull of gravity neglecting atmospheric resistance, will describe a great a study of the record in the light of science has shown that no such limited meaning could have been intended to apply to the word.

Since these so called "days" of Genesis correspond with what are recognized by scientists as proper divisions of time—Cosmic, Archean, Paleozoic, etc., as identified by the occurrences characterizing each of them, this is but one of the several instances in which science has rendered invaluable service in aiding in the proper understanding of the Biblical narrative of creation.

It will be remembered that in the history of that time terms of quite limited meaning have been applied to greatly extended subjects; thus "Israel doth not know, my people doth not consider," in which the name of one man is used to designate the whole nation of his descendants.

The significance of the word day as meaning a vast period of time deserves all consideration since this apparent contradiction of fact in the

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circle around the globe and return to its starting point; and should this point be away from the equator, and the projectile start in a direction parallel with it, it will cross the equator twice before returning to the point of beginning. The same law applies to the materials constituting a rotating fluid globe—the sun for instance. The portions away from the equator tend, and the denser move toward the equator. Since equatorial portions move faster than the rest, the slower portions projected into the faster act as a drag upon the latter, retarding the contact portions and producing a whirling effect. An enormous amount of friction is the result, generating forces which produce expulsive effects from the more interior portions. Again these slower moving portions projected into the more exterior and faster-moving mass produce additional friction by their dragging effect. On the earth this same influence manifests itself today in the Gulf Stream and Japan current; and is responsible, no doubt, for the broadening of the land at the equator in both hemispheres.

These two series of movements cause an immense amount of friction with its attendant production in the sun of radiant energy—heat, light, and electrical and magnetic energy. The whirls mentioned produce the sunspots, as these are seen to be depressions below the solar surface, and the larger and more frequent ones are found to be exactly in the zones in which there should be most activity from the causes described. Then we may reasonably conclude that the sun's heat has been maintained at the expense of its energy of rotation through countless ages, and will be maintained in the same way for ages yet to come. Scientists agree that the sun's temperature may not have been reduced at all for vast ages past.

sacred record was once the stronghold of those who discredited the narrative and a stumbling block to the religious world. However, the objection has been generally abandoned, though it still is well to inform the younger Biblical students in the matter.

The form of description: "And it was evening and it was morning, one day," is the most positive manner of designating a period that is only completed *with the beginning* of another. The words mark unmistakably the ending of one and beginning of another period without any lapse whatever between; while in the case of our ordinary day, there is evening, *then night* and then morning—each day being separated from the next by a period of darkness.

Here is still another particular in which the phraseology indentifies the Biblical day with a geological age. "It was evening and it was morning" aptly represents the gradual fading out of one and the gradual coming in of another period, or a somewhat blending of one into the other. The geologists tell us that toward the close of one period the organisms that chiefly characterize such period became degraded before becoming extinct and even go over in such degraded forms into the next period; while those species that are destined to become dominant in a particular geologic age generally make their appearance in imperfect forms as regards the type near the close of the age preceding.

Note also a remarkable peculiarity of the description of the days of creation. The first day had no morning, for it was immediately full day. "It was evening and it was morning, the seventh day" indicates that the seventh day has had no evening, since the seventh day—like Quaternary Time—is still in progress. It matters not if other peoples used this manner of speaking of the day—they obtained it from the same source.

It is significant that the wording of the Biblical record, though extremely simple, was made to cover in so many ways the actual conditions found to exist. It is not necessary to imagine that the panorama of creation was made to pass in visual review before an observer, for the words of the narrative adequately and fitly describe the occurrences depicted, as will be seen.

At last the earth had ceased to be a luminous globe though still too hot for water to rest upon its surface, and hence was enveloped in the densest cloud sphere and consequently in darkness, while the glowing sun shone brightly outside the cloud envelope which it was powerless to penetrate. And thus we see how God had divided the light from the darkness.

> "And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters." (V. 6.)

It has been supposed that the Hebrew word "rakia" erroneously translated "firmament" described the "firmament" to be like a solid hammered out metal covering, but later renditions of the word give it the meaning of an expanse, and the idea of hammering out metal has reference to the likeness of noise produced by blows upon sheets of metal in hammering it out thin. This fitly describes the peals of thunder that must have characterized this stage of the earth's development.

Verse 20 also furnishes strong support for this corrected translation where it says, "And fowl that may fly in the open firmament (expanse) of heaven." It is evident fowl could not fly in the hammered out metal dome, nor could it be *open.*

The joint testimony of geology and meteorology fully confirm this view. As a matter of fact, every adult of the tropics and subtropics has seen a dense fog settle over the land, and has also witnessed violent electric storms; *but never the two together.* Hence, so long as there was no condensation of water upon the earth's surface, the fog held the earth in close embrace, and there was no sea, no open expanse—mistranslated "firmament"—and no electric storms. But coincident with the formation of the open expanse and the shallow hot sea ("waters under the firmament"—for geologists assure us that every portion of the earth's surface has been covered with water), the conditions well known to meteorologists as producing electric storms, were realized.*

It is by no means impossible that had the highly organized beings of today been placed upon the earth at that time the noise alone might have killed them. Thus, as stated in Genesis the noise as of hammering out metal came along with the production of the open expanse that divided the waters (clouds) from the waters (sea). And the earth was still enshrouded in darkness, with gradual diminution of the cloud depth and concurrent deepening of the hot, universal sea.

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*The condensation of water vapor into fog or cloud particles is supposed to produce an electric charge on the surface of the globules, and when these coalesce into raindrops the surface area is much reduced, with corresponding diminution of their capacity for storing electrical energy; hence the excess is necessarily discharged to other objects of lower electrical tension with the attendant lightning and thunder. It is commonly supposed that the shower usually following a vivid flash of lightning is caused by the lightning, but the reverse is the fact. The formation of the rain produced the lightning.

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> "And God made the firmament, and divided the waters which were under the firmament (expanse) from the waters which were above the firmament (expanse): and it was so.
>
> "And God called the firmament Heaven. And the evening and the morning were the second day." (Vs. 7 and 8.)

This was the end of the second "day" or earliest geologic period—Archean; and as science informs us, the earth continued cooling.

> "And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear; and it was so." (V. 9.)

And now, in obedience to God's command, which is the law of nature, and as science tells us, with the shrinking of the earth through further cooling, the crust wrinkled and curved so that a portion of it rose up through the water and formed dry land. When this first dry land appeared above the waters it formed an island, and was surrounded by water, so that the whole ocean was connected as one body of water, and was literally "in one place."

> "And God called the dry land Earth; and the gathering together of the waters called he Seas, and God saw that it was good." (V. 10.)

The reader's attention is particularly called to an historical occurrence illustrating the accuracy of the original Hebrew Bible, and showing how science vindicates its claims. Here the original text did not say God saw that it was good. Everyone supposed that when dry land appeared out of the water, then if ever the earth must have been *good,* and the world wondered for centuries why it was not so stated. So when the Septuagint translators reached this point in their work, being convinced it was an accidental omission, they interpolated the words, "And God saw that it was good." *

The world accepted the work, and it became popular, for it was used by both Josephus and Philo, as well as quoted by New Testament writers. At last it remained for science, less than two hundred years ago, to show that the inspired writer of Genesis was right and the seventy odd translators were wrong, for science shows that at this point in the earth's development it was *anything but good,* for the atmosphere, laden as it was with carbon dioxide, was poisonous to animal life, since it is a fact that animals quickly die by asphyxiation in an atmosphere containing even relatively small amounts of this gas. But during this period, called the "third day," Genesis and science agree that the beneficent hand of the Creator planted the earth with vegetation, which science says at once began to absorb the deadly carbon dioxide, converting the carbon thereof together with water into cellulose (wood-fibre) and setting free into the atmosphere the oxygen it contained, which is so necessary to the support of animal life that was to come, so soon as there was sufficient oxygen present, and removal of the poisonous gas to permit it.

> "And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind whose seed was in itself, upon the earth, and it was so.
>
> "And the earth brought forth grass, herb yielding seed, after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good." (Vs. 11 and 12.)

Now when at the Creator's command the earth had "brought forth grass—herb yielding seed after his kind, and the trees yielding fruit, whose seed was in itself, after his kind"—the recorder stated, *"God saw that is was good."* (V. 12.)

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*C. B. Waring, in Scribner's Monthly, No. 15, Page 820.

But this was not the only means the Creator devised for reducing the carbon dioxide in the atmosphere. The law of solution of gases operated then as now and according to this law gases are dissolved in water in proportion to the pressure, other things being equal. The writer found much more carbon dioxide in a city water supply when taken from the bottom of an *open reservoir* than was held in the water when taken fresh from the delivery pipe of a deep well. Now, if there was *much more* of the gas dissolved in the water with the pressure of but ten feet of water above, what must its capacity be with the pressure of miles of water above? For it is a law of nature that gases soluble in water, as is carbon dioxide, *migrate downward* into the depths, on account of this pressure. As the water cooled more and more it absorbed increasing amounts of the gas, since it is more soluble in cold than in warm water.

It is not difficult to account for the advent of life upon the earth, for life, being everywhere, simply manifested itself so soon as conditions suited to its manifestation prevailed.* This law

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*The materialist accounts for the beginning of life on the earth by first adopting the Newtonian theory of light, which involves the belief that emanations of infinitesimal particles are emitted from the luminous body which strike the eye or illuminated object, whereby the effect is produced; and second, by assuming the presence in cosmic space of countless microscopic germs, which may be carried bodily by the corpuscular projectiles to the earth or any other suitable abode for such germ.

Let us examine this theory in the light of physics and biology.

These solar emissions being material, are subject to all the laws of matter. When they come within the sphere of gravitation of any planet they would be attracted to and remain with it; which is decidedly not the case since we have reflected light from even the largest planets. Or else, coming within its atmosphere, which would by friction—traveling at the velocity of light—generate like the shooting stars we often of life I believe to be universal as gravitation, and operative on all the planets of the many million solar systems known to exist in cosmic space, notwithstanding the cosmos extends in all directions to distances whence light traveling at the speed of 186,000 miles a second takes tens of thousands of years to reach us.

Now, the so-called evolutionists say: "Why, that is spontaneous generation. This writer is reviving it!" Let them call it what they please. They call everything "spontaneous" the cause of which is not seen. They just as readily accept any secondary cause as final. As a matter of fact, spontaneous generation is just as true as spontaneous motion, and no truer.

Here is an illustration of "spontaneous" motion. The pseudo-scientist observes the face of a watch and the hands pointing accurately hour

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see, heat enough to destroy any living organism they might come in contact with, not to say, dissipate itself in gas. Then should the encounter with the germ occur outside any planetary atmosphere, if the impact did not produce heat sufficient to destroy the germ the inertia of the latter would impair or destroy the momentum of the corpuscle. Again, as a matter of fact, no form of matter acquires motion without the application of force greater than the resistance, and violent projection of cosmic matter so far as we know is always attended with great heat.

Furthermore the corpuscular theory of light cannot be true for this reason: that in the case of reflected light, if the projected corpuscles could in defiance of gravitation and atmospheric friction, leave the reflecting body at all, their velocity would be greatly impaired; while reflected light is found to have the same velocity as direct light. Even the light of the most distant stars visible, traversing space requiring tens of thousands of years at a speed of 186,000 miles per second to reach us, is not in the least impeded by the medium in interstellar space or our own planetary atmosphere.

The emission theory of light is still otherwise a physical impossibility. The force of such projection is estimated to be so great that a single grain of matter moving at the velocity of light would have a destructive power equal to that of a mass of 3350 tons moving at the rate of 1500 feet per second.

How long could the earth withstand such a bombardment? And if particles of matter massive enough to move a living organism through space were being poured by the sun upon the earth which is a mere point in space, what must be the sun's annual loss to the entire sphere about him? Yet astronomers assure us the sun's mass has not sensibly decreased since the birth of astronomy.

From biology we learn that the germs of many diseases are known *and are large* enough to be seen and studied *under the microscope.*

by hour to the time of day or night, and he calls it "spontaneous" motion, ignorant of the system of gears, pinions, bearings and the spring encased within. In some way a single wheel is laid bare. It turns in unison with the hands, so he concludes that he had been mistaken and that this wheel is the cause of the motion. And indeed it is *a* cause,—and so is every wheel within the watch, for the removal of any one of them would cause the motion to stop. But the watch runs down, and a gloved hand rewinds it. So he concludes he had made another mistake, and that *the glove* originates the motion. He never once suspects that back of the mechanism and the glove is the hand directed by the same intelligence that planned and produced the watch. And so it is with those who cannot recognize a supreme controlling intelligence in all the wonderful works of nature. No matter how many secondary causes we may find for the processes of nature, we cannot eliminate the ultimate first cause of all.

But if life is everywhere, and will manifest itself whenever and wherever suitable conditions appear, why may we not yet fulfill these conditions and thus have so-called spontaneous generation? Well, what if we do? We cannot eliminate the same first cause represented in the life that is everywhere. So-called spontaneous generation has not yet been produced though scientists have tried faithfully to achieve it. Should it ever be accomplished, I for one will acclaim it; and according to my view as set forth herein it would vindicate Genesis.

We have found that when the work and claims of the false scientist are eliminated, science furnishes reliable and invaluable data upon which to base our quest for the Origin of Man; and that Genesis, when read aright, furnishes certain knowledge concerning obscure matters capable of being and which are verified by science, and hence is trustworthy in other matters not more difficult, but beyond the province of science.

Having determined the extent of validity of our sources of information, we may now proceed to develop our conclusions regarding the Origin of Man.

> "And it was evening and it was morning, the third day." (V. 13.)

The Biblical record tells us that vegetation preceded animal life upon the earth. Although the fossils of the Laurention rocks have not to any extent been preserved, owing to the powerful agencies of destruction that were operative during that age, science furnishes constructive evidence of the truth of this claim: (1) That the vegetable organisms were necessary to furnish food for those of the animal kingdom; (2) that the earliest plants could endure higher temperatures than the earliest animals; (3) that the atmosphere for a time though ideal for plant life, could not support animal life. Thus ended the "third day" of Genesis and with it, Eozoic Time.

During this stage of the earth's development there must have been a dim, diffused light, seeping as it were, through the continuous but thinning cloud sphere such as on a dark stormy day, as some light was necessary for plant development. But while the conditions favored that class of "plants whose descendants still seek the shade" (Lowell) the sun and moon were still not visible in the heavens. The testimony of geology to this fact of a dim but increasing light, is found in the character of the organisms contained in the geologic strata. It is found that the first animal organism on the earth had no eyes, since these were practically useless. Then eyes came with later species, though not a product of the enlightened environment, for we have today the representatives of those early orders and they are still without eyes.

The next meteorologic change observed was the further coalescence of the cloud particles and precipitation to a degree forming rifts in the clouds through which the sun actually shone intermittently at first at long intervals upon the warm earth.

> "And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years.
>
> "And let them be for lights in the firmament of the heaven to give light upon the earth: and it was so." (Vs. 14 and 15.)

Lights in the firmament of course are quite different from light as an abstract term.

> "And God made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also.
>
> "And God set them in the firmament of the heaven to give light upon the earth.
>
> "And to rule over the day and over the night, and to divide the light from the darkness: and God saw that it was good.
>
> "And it was evening and it was morning the fourth day." (Vs. 16-19.)

And thus ideal conditions were ultimately realized for luxuriant growth of vegetation on the earth, to wit: warmth, moisture, sunlight and a dense carbon dioxide atmosphere. With the advent of this rich and abundant vegetation the Carboniferous Age began.

Although vegetation had long existed on the earth it required the same direct sunlight of the "fourth day" to stimulate vegetation, that had already made eyes necessary in the most highly developed mollusks, the radiates, and the fishes of the Silurian and Devonian Ages. It must have required a vast lapse of time between the first appearance of vegetation and its development to a point of luxuriance sufficient to even begin to form the coal beds of the Carboniferous Age. It is estimated that probably eight parts of dry vegetable matter is required to form one part of coal, and an average of two parts of green wood to supply one part of the dry, then taking into account the respective specific gravities of coal and dry vegetable matter a coal stratum of four feet thickness would have required about a hundred and fifty feet depth of green wood to produce it. There are certain chemical considerations suggesting the probability that a still greater relative depth of green vegetation was required to produce the coal measures; which would indicate the enormous lapse of time during which they were in process of formation.

With the appearance of the opening through the clouds the "lights" appeared in the firmament as stated in the Biblical record of the "fourth day." It will be noted that in verse 4 it is said *God* divided the light from the darkness, while verses 14 to 18 say the *"lights" in the firmament* were "to divide the light from the darkness and at the same time to give light upon the earth." In the first instance the light was cosmic light—when the whole solar system was one luminous mass, and in the second, solar light, after the separation of the earth.

> "And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven.
>
> "And God created great whales,* and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good." (Vs. 20 and 21.)

The water animals, which are those requiring least oxygen for respiration, science as well as Genesis assures us were the first to appear, because, according to science, the atmosphere contained a smaller proportion of that element than during later periods. Dana says of the late Silurian:

> "The seas abound in life, but no trace of anything terrestrial has yet been found."
>
> "And God blessed them, saying, Be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth." (V. 22.)

That the waters of this stage *did* bring forth abundantly the moving creatures and *filled the waters in the seas* is abundantly verified by geology in the fact that the Paleozoic waters deposited the remains of the early organisms to depths of thousands of feet in thickness. Some one-celled organisms are found to divide in two every thirty-five minutes, and therefore in ideal conditions to be capable of producing a total of 2,405 billions in twenty-four hours,—the progeny of a single primal ancestor. Ideal conditions, however, are never realized.

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*"The word rendered 'whale' may mean any large water vertebrate."—C. B. Waring in Scribner's Monthly, Vol. 15, page 823.

> "And it was evening and it was morning, the fifth day." (V. 23.)

Water doubtless was then cooler than the land, and earlier permitted the presence of living organisms.

> "And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so.
>
> "And God made the beast of the earth after his kind, and cattle after his kind, and everything that creepeth upon the earth after his kind: and God saw that it was good.
>
> "And God said, Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepth upon the earth.
>
> "So God created man in his own image, in the image of God created he him; male and female created he them.
>
> "And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth. . . . .
>
> "And God saw everything that he had made, and behold, it was very good. And it was evening and it was morning, the sixth day." (Vs. 24-28 and 31.)

According to the record the "beasts of the earth," "the cattle," and the "creeping thing" were the earlier creations of the "sixth day."

The earliest land animals geologists have so far found belonged to the early Carboniferous Age, and these consisted of spiders, scorpions, centipedes, may-flies, cockroaches, crickets (creeping things) and reptiles. The other animals and man completed the work of creation, Specific Man appearing as the crowning glory of creation in the Late-Tertiary Period (Pliocene).

The act of the Creator in the beginning is designated by a different word from any other of His acts until the creation of man; then the same word used in the beginning was used again. The word evidently expresses priority. In both cases it definitely marks a beginning—in the first instance the beginning of inorganic nature, in the second—according to my views—that of organic life. The word "dominion" as used in verse 26, over all the animals means a superior relation, such, as an ancestral one would be, which agrees with my conception of the origin of man. It is certain that man *does not control and never has controlled* the fish of the sea, the fowl of the air nor the wild beasts, notwithstanding he has exterminated some of the species, just as their natural enemies among the lower animals have done.

> "And the Lord God formed man *of the dust of the ground,* and breathed into his nostrils the breath of life; and man became a living soul."—Gen. 2:7.

This brings us to Proposition No. 5, stated in chapter I.

It was not until the birth of the science of chemistry but 150 years ago that science was able to confirm this wonderful statement, made by the author of Genesis many centuries before it became possible by human effort to obtain this knowledge.

In view of the accuracy of this marvelous statement as well as all the other transcendent knowledge possessed by the writer of Genesis we are forced to the alternative of either acknowledging the divine source of this knowledge, or satisfactorily accounting for it in some other way. The fact that so many positive and difficult statements, and a stated order of many prehuman occurrences are found by the advanced science of today to be strictly accurate, must mean something. What alone can they mean?

It matters not *to whom* this knowledge was imparted, it would seem it could not have been given by any but the Creator Himself; for who but He could have known the secret of occurrences which took place millions of years before the first man was on the earth? Is not this convincing enough proof of a supreme intelligence?

Recapitulation—The Bible

GENESIS	SCIENCE	
Day 1.	Cosmic.	
Day 2.	Meteorologic—Archean Time.	
Day 3.	Geologic:	Eozoic Time.
Day 4.	Geologic:	Probably the period during which vegetation existed before direct sunlight was admitted to the earth's surface.
Day 5.	Geologic:	Probably the Cambrian, Silurian and Devonian Ages.
Day 6.	Geologic:	Probably the Carboniferous, Permian and following ages up to the beginning of Quarternary Time.

Day 7. Geologic: Quarternary Time. Distinctively the age of Man, and of Mind.

How did the Cosmic system originate?

1. SCIENCE: It was produced by "the unknown source of things." (Herbert Spencer.)
   By "a power inscrutable to the human intellect." (John Tyndall.)

   GENESIS: "In the beginning God made the heaven and the earth." (V. 1.)

2. SCIENCE: The solar system was once a vast nebulous mass, which contained the sun and the earth together with the other planets. (Scientists universally.)

   GENESIS: "And the earth was without form and void." (V. 2.) (Could the earth have had form while in this condition? "Void" relates to the gaseous state of the particular nebula. There are gaseous nebulae. RRS.)

3. SCIENCE: New nebulae have been observed to appear in the darkness of interstellar space. (Read Lowell's Evolution of Worlds.)

   GENESIS: "And darkness was upon the face of the deep." (V. 2.) (The "face of the deep" is the place where the new nebula appeared. RRS.)

4. SCIENCE: With the production of nebulae new light appears where it was dark before. Light is the result of violent motion.

GENESIS: "And the spirit of God *moved* upon the face of waters and God said, Let there be light, and there was light." (V. 3.)

5. SCIENCE: There was a vast immeasurable period before the solar system was evolved from the nebula, which might well be designated as a cosmic period.

GENESIS: "And it was evening, and it was morning, One Day." (Part of verse 5.)

6. SCIENCE: The earth, at first a self-luminous globe, finally had cooled to the extent of permitting water from the dense cloud sphere to settle upon its surface, forming an all-enveloping hot sea, with an open space between the cloud sphere and the universal sea. (This might be considered the second period in the evolution of the earth.)

GENESIS: "And God made the expanse, and divided the waters which were under the expanse from the waters which were above the expanse, and it was so." (V. 7.) End of the second day of creation.

7. Science: The next period in the evolution of the earth was its contraction from cooling, until the solid crust began to wrinkle and fold so that at last a portion of the crust arose out of the water, appearing as an island. The sea being one continuous body, was literally "in one place."

Genesis: "And God said, Let the waters under the heaven be gathered together in one place, and let the dry land appear. And it was so." (V. 9.)

8. Science: Since plants require carbon dioxide and moisture with light and warmth for their development, conditions were at last suited to vegetable life, but unfit for animal life. So vegetation appeared.

Genesis: "And God said, Let the earth bring forth grass," etc. (V. 11.) (Here the third day, corresponding to Eozoic Time, ended.)

9. Science: Heretofore the cloud envelope admitted enough diffuse light to the earth for the earliest plant life, but no rift had yet appeared. Sun and moon were not yet visible; but now, with further cooling and precipitation, rifts appeared in the cloud-sphere through which both sun and moon became, for the first time visible.

Genesis: "And God said, Let there be lights in the firmament of the heaven to divide the day from the night," etc. (V. 14.)

10. Science: In the Cambrian and Lower Silurian seas animal life appeared abundantly. Says Dana: "The seas abounded in life, but no trace of anything terrestrial has yet been found."

Genesis: "And God said, Let the waters bring forth abundantly the moving creature that hath life," etc. (V. 20.)

11. Science: The Paleozoic seas were so rich in animal life that their remains formed deposits thousands of feet in thickness. As a matter of fact, some of the unicellular organisms multiply at such an enormous rate that *in ideal conditions* they would in twenty-four hours form one-tenth the volume of water in which they developed, and thus would literally "fill the waters in the seas" in ten days' time.

Genesis: "And God blessed them, saying, Be fruitful and multiply and fill the waters in the sea," etc. (V. 22.)

12. Science: Land animals made their first appearance in the Carboniferous Age.

Genesis: "And God said, Let the Earth bring forth the living creature after his kind, cattle," etc. (V. 24.)

13. Science: Last of all, Man appears on the earth.

Genesis: "So God created Man in His own image," etc. (V. 27.)

CHAPTER III

EVOLUTION

Evolution is a universal law of progress, operating throughout nature, both physical and metaphysical. Transmutation is an entirely different matter. It is the purpose in this chapter to discuss the relations of evolution and transmutation.

Evolution is progression toward a goal—Transmutation is passing by suitable changes across a boundary from one well-defined state or condition into another.

Whether or not transmutation (so-called evolution) of species conflicts with the Bible it is not necessary to consider. We are only concerned with whether it is true. When the subject of evolution has attained its type, no matter how distant the goal, a new beginning must be made, for Evolution is in cycles.

And so we find the acorn evolves into the seedling, the seedling into the sapling, the sapling into the towering oak tree; the tree produces the blossom which evolves into the acorn, completing the cycle. The new acorn begins a new cycle producing another oak seedling. This is evolution. If the new acorn produced a pine seedling this would be transmutation.

The embryonic germ of the human evolves into the infant, the infant into the youth, and the youth into the adult, thus closing the cycle of evolution, but not human progress.

The species evolve—not into new species, but reaching their perfection, the cycle of a new species appears. Science is silent as to the manner of their entering, but finds this to be practically abrupt. That life made a first appearance upon the earth is sufficient warrant for the claim that the species made abrupt beginnings, which geology so far confirms. But we may be sure this was accomplished in strict accordance with natural law, for the laws of nature are the voice of God.

From an unbiased examination of the evidence, transmutation of species appears to be impossible.

There are opinions opposing this, therefore let us consider the evidence which justifies it. The appeal of those who will dissent from this opinion is based for the most part on the works of Charles Darwin and Thos. Huxley. Their works have done much for science, and the world recognizes both as honest and truth-loving men. But claims are attributed to them which they never made.

Darwin never claimed to have proved that man is descended from an ape, living or extinct. He recognized that the proof failed in the "missing link," and that a chain is no stronger than its weakest link; and Huxley did not indorse transmutation of species, as is shown in the following quotation from his work, "Evidence of Man's Place in Nature":

> "*If* the animated world presented us with none but structural differences *I should have no hesitation* in saying that Mr. Darwin has demonstrated the existence of a true physical cause amply competent to account for the origin of living species, and of man among the rest.
>
> "*But in addition* to their structural distinctions the species of animals and plants, or at least a great number of them, exhibit physiological characters—what are known as distinct species structurally being for the most part either altogether incompetent to breed one with another, or if they breed, the resulting mule, or hybrid is unable to perpetuate its race with another hybrid of the same kind.
>
> "*A true physical cause is, however, admitted to be such only*

on one condition—that it shall account for *all the phenomena* which come within the range of its operation. *If it is inconsistent with any one phenomenon, it must be rejected.*

"I have put this conclusion as strongly as possible before the reader, because the last position in which I wish to find myself is that of an advocate for Mr. Darwin's or any other views —if by an advocate is meant one whose business it is to smooth over real difficulties, and to persuade where he cannot convince." (The author italicized six separate portions of the above quotation.)

It is not surprising that these able scientists could not prove transmutation of species, for the simple reason that there is no visible evidence in support of it, while there is a great deal against it. They based the claims they did make on *structural* evidence alone; but it is certain that man is more nearly related embryologically and spiritually to the dog than to the ape. As a matter of fact "Evolution of Species" is a paradox, since it is a contradiction in itself, for the very *fact of species*, which is self evident, is an incontrovertible denial of their possibility of transmutation. The intervals would be filled with the insensible gradations of the transitionals and render specific bounds impossible. There could then be no such thing as species. Suppose for instance animals evolved into other forms as insensibly as the passage from infancy to maturity, would not the term "man" or "horse" be entirely without meaning? The claim has been made that the geological evidence is fragmentary and undeveloped and may yet produce the missing links. But where are the transitional forms among the living species? There are none. Transitions, from the multitude and unmistakable sequence of the forms, are easily detected. Suppose a biologist should be placed upon the earth today, never having witnessed the evolution of a man from an infant;

he would have no difficulty in discovering the origin of the man in the infant, by simply observing the numberless grades of the transition. Indeed, he could not escape making the discovery. And just so would his conclusions be compelled by the manifest transmutation of the species both fossil and living, were this a fact.

No one has ever produced a "missing link." The Neanderthal man, for whom so much has been claimed in this direction, was a fine type of man, said to be of large brain and broad shoulders. Carl Vogt, a distinguished scientist says of primitive man:

> "This powerful, tall, and strong primitive man, who lived by the side of the cave-bear and the mammoth, already honored his dead by burying them in grottoes closed with slabs, and furnished them with meat and arms for their journey into another world. He knew the use of fire, and constructed hearths, where he roasted his meat; for of pottery the traces are but few. His implements or weapons consist of rude hatchets and knives, which were struck off from a flint block by another stone, and of worked bones employed for handles, arrows, clubs, or awls. This wild, primitive man endeavored to ornament his person with perforated pieces of coral and the teeth of wild animals. He probably dressed in skins or prepared bark of trees."

In 1921 the most ancient specimen of fossil man yet known was discovered at Foxhall in the Upper Pliocene (Tertiary). This Foxhall Man is described as large-brained and was "capable of making ten or twelve different kinds of flint implements, of providing himself with clothing and of building a fire."* Man thus was found upon the earth prior to glaciation, and hence he was able to survive four glacial eras,—the only species that did so. ← Error (The author)

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*Science, Sept. 1, 1922. "Recent Discoveries of the Antiquity of Man." By Henry Fairfield Osborn and Chester A. Reeds, American Museum of Natural History.

Until the discovery two years ago of this Foxhall Man, all the human remains and monuments had been found in Quarternary deposits, so that it seemed almost certain that man came upon the earth in the

But even should a fossil specimen of a supposed "missing link" be yet found, as may sometime be claimed, it may be (a) a hybrid, incapable of repeated reproduction, or (b) a monstrosity. Unless it could be proved to be neither it would be inadmissible as evidence.

And after all, one of Darwin's basic postulates is untrue, to wit: Environment is not a controlling factor in the evolution of fundamentals. For instance, the eye—an organ designed solely to function in the medium and by the agency of light—is formed in its perfection with all its delicate co-ordinations intact *in the entire absence of light.* Again, the lung with all its intricate structural completeness is formed in an environment in which there is neither air to breathe nor need for breathing. And yet further: A complete digestive system, ready for immediate action is produced in an environment where there is nothing to digest nor call for digestion. The evidence in all these cases points to a controlling and directing intelligence outside the environment, acting wholly in anticipation of future needs. Further, the fact that these preordinations are common to all viviparous animals points to a single controlling intelligence.

To all of this let us add the further fact that the same environment has evolved two classes of organic beings having directly opposite characters—the vegetable and the animal kingdoms; the one assimilating the carbon of carbon dioxide and eliminating oxygen—the other assimilating oxygen

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age that is still in progress, corresponding to the seventh day. Yet the author of Genesis distinctly stated that man was created late in the sixth day, which is at last vindicated by science.

In view of this and other considerations it would almost seem necessary that before scientists settle definitely a matter of fact, it were well to inquire whether or not it squares with the Biblical claims in the premises.

and *producing* carbon dioxide. This fact of co-operation between the two great organic divisions seems to point clearly to a beneficent intelligence differentiating, yet co-ordinating the cognate branches of organic life in their needs and functions for the preservation, each of the other; for without vegetation to restore the oxygen to the air all animal life would perish by asphyxiation, while without animal life the carbon dioxide so necessary to plant life, would ultimately become exhausted.

To emphasize the importance of this difference let us further investigate their respective functions.

The beginning having been made in the extreme manifestation of energy, this energy represented potentially all the forms of matter including the bodies of the organisms afterwards to be on the earth. The elaboration of vegetable tissue requires the expenditure of both heat and light, which energy is stored up in such tissues. Motion therefore is clearly a component of the complex of higher organization. Plant life improved primeval conditions by ridding the atmosphere of most of its carbon dioxide, thus rendering the environment favorable to still higher forms of life. The latter, on the other hand, by restoring the carbon dioxide to the atmosphere, degrades the environment by promoting a revulsion toward primeval conditions. Plant life therefore is the support of animal life, which advances on a higher plane at the expense of the physical environment.

Some animals are continually locking up the carbon dioxide—which means also locking up oxygen—in the lime carbonate used in the construction of their shells; but here again the vegetable organisms come to the rescue of the animal world, for they absorb the lime carbonate from the soil through their root system and liberate the carbon dioxide again.

It cannot be denied that environment and selection have promoted evolution of each of the organic species to its natural limits, but what appears to be transmutation of vegetable species may be due to a faulty system of classification.

The present system, called the "natural system" is the most convenient one yet devised, but the very fact that cross-fertilization within certain bounds results in hybrids which are competent to interbreed would seem to cast doubt upon the validity of the system. Mr. Burbank, the distinguished botanical scientist has produced many new and apparently permanent varieties by crossing two individuals of different so-called species; as, for instance, one aggregate fruit upon another,—like the raspberry and the blackberry; or one stone fruit upon another, like the plum and the apricot. It would seem the classification should be broader, so that this very limitation of capacity to interbreed should form a basis upon which specific distinctions are determined.

Thus it is seen the question of transmutation of species rests at present upon the very flimsy foundation of the definition of terms.

Notwithstanding all the evidence showing transmutation of species among the animals to be impossible, what mean the many analogies and suggestions of the passage from lower to higher forms in nature?—for there are many. We find the crawling caterpillar, suggestive of the reptile stage, after a period of inaction simulating death, reappearing as the butterfly, in a quasi new birth and suggesting the bird stage. We have also the tadpole a gill-breathing legless animal—a true fish, evolving into the frog, a lung-breathing animal and a true quadruped. But neither of these is transmutation of species, for when the butterfly's egg hatches the offspring is a caterpillar and not a butterfly. And when the frog's egg hatches the product is not a frog but a tadpole. These but simulate passage through an obscure process to higher forms.

Now let us take the case of man himself, the highest product of creation. The infant enters this life a soft, helpless thing representing the protozoan stage of life on the earth, its limbs now unfit for their later uses and representing the flagella of the infusorian; then by evolution reaching the stage of the quadruped as it goes on all-fours. Later still it evolves into the advanced quadruped stage standing erect with unsteady poise for a moment, to go down on all-fours again; but continuing still to advance it at last reaches the human stage where it is permanently erect. And the earlier evolution of the infant from a microscopic one-celled organism, tells the same story of a pseudo-transmutation.

Embryology presents this latter series of evolutions in the life history of every individual human. The earliest form of the individual human being a one-celled organism, representing the first appearance of life on the earth as the primordial germ, it successively passes through progressive modifications resembling at various ascending stages the respective embryos of lower animals, the last resemblance being to that of the dog; then it takes on the specific characters of the human.

We have seen that both embryology and evolution show that man came up in some way through the species from the lowest, yet not by transmutation, for science and our universal observation show unmistakably that there was a break in the ascent at every species. We find that the individuals of every species die and their successors are the same in all particulars; but species themselves pass away, with succession of new ones physically unlike the preceding, yet after the same general plan; and then birth in the new species, of individuals of exactly their kind. The author entertains a strong conviction that each species is the embodiment of an immediately preceding one through rebirth into the world, and will cite his reasons for this conviction.

It seems clear that the primeval progenitors of each new race or class of beings must have been placed here practically perfect at the very threshold of their respective periods, in order that the succeeding souls might have the opportunity for re-birth; how otherwise could they have appeared so abruptly? But as to the manner of their appearance science is absolutely silent, except to testify that in each case the appearance was abrupt, as suggested in Genesis. Until science produces contradicting facts we must consider that each primeval pair was directly produced by the Creator of all things to accommodate the waiting souls of some previous organic beings. But whatever the manner of their appearing, we may be sure this was accomplished in strict accordance with natural law, for the laws of nature are the voice of God. The fact that life made a first appearance on the earth is sufficient warrant for the belief that the Creator produced the species intact.

Mankind look forward to their appearing in some higher form hereafter, and it is doubtless but a continuation of the original plan instituted and executed from the beginning and so uniformly pursued to the present time. How do we know but that the lower animals possess in some form a consciousness of the promise of a future life, just as without exception they possess a knowledge of the means of propagating their species, and invariably provide in advance for the protection and care of their offspring, where such protection is needed.

Why should we deny to others of God's creatures this same hope and the same experience in the past ages, since we recognize the unfailing unity of all His works?* Without this explanation of the mystery of life, what were the purpose of the animals? Some have tried to answer this

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*That there is a unity in the composition, plan and purpose of all creation is becoming more and more evident to the thoughtful. The spectroscope shows unmistakably that all the cosmic bodies, including the members of the solar system, are the same in chemical constitution, notwithstanding the cosmos extends to distances whence light traveling with a velocity of 186,000 miles a second, requires thousands of years to reach us. The whole of cosmic space contains according to present scientific theories the medium called the "luminiferous ether," and the law of gravitation is proved to be universal.

Many familiar objects are one and the same material though differing in form, for instance: The snowflake, glacier, iceberg, dew, frost, cloud, rain, steam and water are familiar forms of one and the same substance. They pass readily through these several phases. The invisible aqueous vapor crystallizes and falls on the mountain top as snow; the snow becomes the glacier whose enormous weight causes it to "flow" in solid form down the ravines, then breaking off into the ocean it becomes the iceberg. The iceberg melts into water, passes again into vapor, constituting a well defined cycle. The cycle begins again with the vapor, and is repeated over and over and over again. Or else, the vapor may condense to clouds, and this passing over the land falls as rain to refresh the thirsty earth; then reappearing as the spring gathers into the river and passing on to the ocean where it again vaporizes, completing the cycle in another way.

The unity shown above is only in forms of the same substance; but is even more profound than this. A number of instances show that two unlike substances may be the same in percentage composition. For instance, benzene, or benzol, is composed of one part hydrogen and twelve parts carbon, while acetylene has exactly the same proportions of these two elements. The difference is due to the structure of the molecule.

Urea and Ammonium Carbamate have the same percentage composition. The presumption that all the forms of matter are composed ultimately of a single substance is very well supported. Pointing to question by saying the animals were created for the service of man. If so, I ask, what of the animals of pre-human ages?

It is no disparagement to mankind to propound the theory of the progressive passage of the soul through all the earlier forms of life; for man—the boasted lord of creation—is intrinsically not so much the superior of the other animals as is generally assumed.

To the student of animal life and habits, the similarity of man and the lower animals is astounding, for it is known that many species possess in greater or less degree practically all the attributes of humanity, while some of their works and institutions equal or surpass the corresponding ones of man. In a just comparison of the lower animals with man the proper handicaps must be applied to make the rivalry equal. The possession of articulate speech gives man a marked advantage over the animals, securing for him exchange of ideas; and written language gives him the accumulated knowledge of the ages, while each animal must begin just where his parents began and possesses only the knowledge he may gain by his own experience. We must also remember that in the case of the dog, for instance; his life here is but about twelve to fourteen years, while the allotted period of man's life is threescore years and ten. On this score alone the attainments of a man must be divided by five to be just equal with the dog. The score is even better for the lower

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such an eventuality are the facts of tungsten and radium splitting up into simpler bodies; and the metal ammonium, which has never been seen as such—but having properties analogous to those of the metal potassium—always breaks up into hydrogen and ammonia gas when eliminated from its combinations, and ammonia (gas) is composed of hydrogen and nitrogen. Recently hydrogen electrons have been knocked off the nitrogen atom, showing that hydrogen is a component of nitrogen.

animals than that, for the capacity to learn is cumulative; so that the extra years of a man's life furnish far greater opportunity for acquiring knowledge.

(That a just appraisal of animal character and initiative may be obtained the reader is referred to the chapter on "The Animals.")

However we may regard the fact, there is no escape from the conclusion as already stated, that there is in some way a close relationship among the organic forms throughout the whole range of the species beginning with the earliest, and up to the highest.

This manifold hint of relationship is doubtless profoundly significant. What its significance is, the author will endeavor to show in the next chapter.

CHAPTER IV

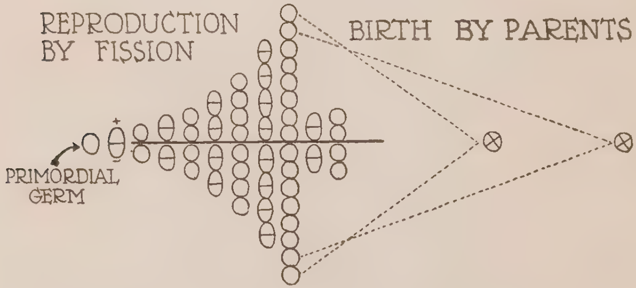
PRIMORDIAL MAN: ORGANIC MAN: SPECIFIC MAN

In both of the series of evolutions described every individual human proclaims by analogy his having passed through many different forms of life, beginning with the lowest and continually ascending in the scale of organic being to his present stage. According to science the only life that could endure the conditions prevailing in Eozoic time was the simplest form, a one-celled organism, propagating by fission (division into two). The primordial germ was necessarily of this kind. Here let us recall the characteristics of prophecy and of retrospective psychic vision, namely: Combining in one sweep of vision all phases of the subject of vision, retrospective and prospective, with entire disregard of the time element. We are told the Creator breathed the breath of life into man, having made him of the dust of the ground, and only of man is this said. Now science furnishes evidence showing that the primordial cell or germ *alone* received this inbreathing of life into the inanimate form. Hence the primordial cell or germ *was man*. This then—the initial appearance of life on the earth, let us call Primordial Man.

Primordial Man contained potentially all the successive organic forms—with all his future diversities and possibilities up to man as we know him—*Specific Man;* but in order to reach the present, his highest manifestation so far, it was necessary that he must pass in the observed order through the intermediate organic species. This entire range of forms let us call *Organic Man.* Therefore, God "breathed the breath of life" into man as we are told in the sacred record of creation, when He gave life to the primordial germ.

I will here recall to the reader's attention Jesus' remarkable statement regarding the destruction of the temple and *the end of the world,*—or more properly, the end of the age, to-wit: "This *generation* shall not pass away till all be fulfilled." Is not this a veiled recognition of the whole scope of organic life as one generation, and if so, as man?

Reproduction by fission began with the primordial cell and remained the only mode for a vast period. These one-celled organisms acquire a dividing wall across the middle then elongate somewhat and are divided into two new cells, each renewing its youth with each division, and so death was not a necessary concomitant of life. Life therefore must have been continuous, and doubtless was until a definite factor of change entered the system. The illustration shows how it proceeded:



With birth by parents, of the higher orders, came death which then passed upon all, for these fed upon the lower organisms, destroying them in prodigious numbers.

It is a reasonable assumption that the organisms that developed adjacent to the original line of subdivision remained representative of the original cell, and so we have persisting to the present day those forms that multiply by fission; and those departing farthest therefrom suffered the greatest change, resulting by reason of polarity, in sexual, and by reason of degree of departure from the basal line in specific and individual differentiations. During the age of propagation by fission, death probably occasionally occurred *as an accident;* but when birth by parents was anticipated God said, "In the day that thou eatest thereof thou shalt *surely* die." Here the qualification *surely* is of the greatest moment, for then death became a fixed feature of the goal of physical existence.

When God said, "Let us make man in *our* image and likeness," Primordial Man alone could have been referred to, for he alone was like God in the following particulars: (1) He was a plural entity (potential male and female) as will be shown presently; (2) He was essentially deathless; while Specific Man, or man as we know him, in dying, is *not Godlike,* at least in this particular.

The soul is generically one and is not in any sense, quantitative, being in character like God—notwithstanding its multitudinous physical manifestations. So long as this physical subdividing continued the spark of life, or the soul remained with each subdivision and each new cell contained a new soul existing as an independent entity, for soul is universal and every organic unit possesses it. Haeckel speaks of the cell soul and memory.

If I understand aright, the ultimate number of subdivisions of the primordial cell determines the number of individual souls created, and individuality of being was thus established; then with the advent of birth by parents conscious personality became a fact, and every soul born into life on the earth possessed an independent mind. It seems impossible that any soul ever returns to a lower form, for Nature never goes backward.

The primordial cell or germ—Primordial Man—possessed the definite element of polarity, which gave the tendency to divide. Even to this day polarity is a fixed character manifested in both vegetable and animal life as will be shown presently. A magnet has two poles which are opposite to each other. If broken into two or more pieces each part will be found to be a perfect magnet with its two opposite poles. These also may be divided indefinitely and always each piece will be a real magnet. This is because each molecule possesses polarity. The polarity of the cell and the molecule is manifested in the aggregations of cells and of molecules which we call masses. Polarity therefore being an inherent property of the primordial cell still persists by heredity in both the vegetable and animal kingdoms. The florist breaks a twig from his choicest rose, plants one end in moist earth, and it shortly develops roots on one end and flowers on the other. He takes other cuttings from the new plant and repeats the treatment with like results indefinitely. In the animal world it is found that the earthworm, though possessing a head with eyes and mouth, if divided, will develop a head on the severed end of the rear portion and become two complete individuals.

Now, polarity and fission in the primordial cell jointly furnished a potential basis for differentiation. The poles, having opposite characters, possessed opposite potentialities and tendencies. It is not improbable that among other tendencies one-half must have possessed masculine potentialities, the other feminine; and as the two poles became more and more widely separated in the new individuals these tendencies became more and more pronounced, until at last they arrived respectively at the stage of perfect male and perfect female. It is thus seen that woman was created exactly equal with man.

According to this view the primordial germ was Adam, and God formed Eve by dividing the feminine side of the same from the masculine, and called the former Eve because she "was the mother of *all living*" (things). In no other way could Eve have been the mother of "all living," which necessarily includes all animal life, and possibly all living organisms. There is some evidence favoring the probability that both animal and vegetable life began with the primordial germ, for the lowest forms in the two kingdoms are so much alike, it is difficult to determine their affinities,—that is, whether animal or vegetable.

In the vegetable as in the animal world we have the sexes perfectly developed. Many plants have the organs of both sexes—the stamens (male) and the pistil (female) in the same flower, as in the rose family, which constitutes in botanical terminology the perfect flower. Others have the stamens and the pistils in different flowers on the same plant (monoecious) as in the walnut family; while in still others the staminate and the pistillate blossoms are in separate individuals (dioecious), as in the case of the Smyrna fig (pistilate) and Capri fig (staminate).

Since male and female potentials were separated one from the other in the ages past, it is necessary that the two corresponding units effect a reunion before individuals of the higher orders can be engendered; and this is in fact the case in both the vegetable and animal kingdoms.

The Smyrna fig is infertile until invaded by the little wasp—blastophaga—inhabiting the Capri fig, carrying the pollen (male cell) adhering to its body into the Smyrna fig where the necessary union is effected.* Does it not seem then that the sexes having originated in the division of the primordial cell, the first man, could fitly say of the woman "bone of my bone and flesh of my flesh"? And for the same reason could it not be said with a little exercise of the imagination that God took a rib from the man and made a woman of it? Here let us remember that the laws of nature are the voice of God, and that the statement, "God brought the woman to the man," is but a concrete statement of the mutual attraction of the sexes. According to this explanation of their origin, the cells were produced in pairs, the continued propagation by fission of which resulted eventually in the establishment of the opposite sexes in *equal number*. And thus the observed numerical equality of the sexes is accounted for. And this also furnishes a natural basis for the monogamic necessity and law.

While for reproduction of species any two opposite physiological units are competent, yet there is a persistent belief that in the vast future the original soul partners will be restored to each other through some innate mutual attraction, just as the physiological opposites are attracted so strongly to each other that the races are perpetuated with absolute certainty.

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*Mr. Burbank has beautifully told the story of plant fecundation (pollenation) in Orchard and Farm (Los Angeles, Cal.), of December, 1920, and following number.

This postulate furnishes a true basis for the above mentioned widespread belief in the fact of soul mates. The poet doubtless had this in mind when he wrote:

> "Who and what gave to me the wish to woo thee?
> Still lip to lip to cling for aye unto thee.
> Who bade me burn thy very breath to drink—
> My life in thine to sink?
>
> "Is it, beloved, because we were in days of yore
> Twin-bound both souls and in the links we bore
> Strive to be bound once more?"

From these considerations the author believes *tentatively that for every soul there is a soul mate,* and supreme is that man—if there is one—in whom the soul-mates have met.

Notwithstanding the enormous destruction of these lower forms by the higher ones, since they were always produced in pairs the numerical equilibrium of the sexes could not be impaired, for the soul of each passed on as a fixed individual to appear again through birth in the next higher form.

During the ages when propagation by fission was the only mode of multiplication of organic units, the fact of there being no death rendered the command to "be fruitful and multiply and replenish the earth" singularly effective, as witnessed by the enormous quantity of their remains. It matters not how great a number of subdivisions were experienced before the sexual character was developed, the two were literally "one flesh." The sacred record further says: "And they were both naked, the man and his wife, and were not ashamed." This statement must have been applicable to each pair of subdivisions, and the condition persisted until Specific Man appeared and developed in one direction a spiritual consciousness and in the other, the inclination to abuse a divine function.

Now, propagation by fission though persisting to the present day, ceased to be dominant, when the age of birth by parents was instituted, and the command, "Be fruitful and multiply, and replenish the earth," still remained in force, though executed in a different manner. It was the custom in Biblical times to use what are called "dark sayings," such as are mentioned in Num. 12:8; Ps. 49:4; Ps. 78:2; Prov. 1:6; Dan. 8:23; and later, Jesus taught in parables which even his most enlightened students sometimes failed to understand; and we must be prepared to encounter such in the course of Genesis, and consider them accordingly. The knowledge imparted doubtless was affected by this custom, just as ordinary white light coming through colored panes of glass takes on the color of the glass. It would seem in this view that the use of the figure of "fruit of a tree" might well be a "dark saying" conveying a parallel meaning without having any actual reference to a tree. "But of the fruit of the tree of knowledge of good and evil, thou shalt not eat of it; for in the day that thou eatest thereof thou shalt surely die."

While death as a definite factor entered the world coincidentally with and as a result of the change in the mode of propagation, it could scarcely have been intended as a punishment for what normally could not have been an offense against God's government. Death is called an "enemy" because it ends our opportunity for achievement of the progress that belongs to this stage of our existence.

For several reasons the initial exercise of the sexual function is believed by the author to be what was meant by eating "the fruit of the tree of knowledge of good and evil," for having eaten of this fruit the male and female realized their physiological difference and were ashamed. And as a result of its exercise God said to the woman, "I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children, and thy desire shall be to thy husband." None of this was experienced in connection with propagation by fission. Here is a direct connection between this act and the curse. The woman had been told, "God doth know that in the day ye eat thereof, then your eyes shall be opened, and *ye shall be as gods*." Having obeyed the law of nature—which is the voice of God—their eyes *were opened,* and they "knew that they were naked," and what indeed could make them more "as Gods" than the power to create living beings? This God-like power belonged to all animals since the change mentioned was brought about, and death also was experienced by the other animals ages before Specific Man appeared upon the earth; therefore all the animals must have been man (Organic Man) in his earlier manifestations. Yet the curse fell not upon the animals but upon Specific Man alone, because he alone abused and still abuses this divine prerogative.

It was a knowledge of both good and evil, for certainly this knowledge legitimately used is obedience to the Divine command, yet when misused it is as surely a knowledge of evil.

We have seen that the plan of creation is progressive and is continuous throughout. And not only this, but besides the manifestation of infinite intelligence there is as positive evidence of infinite benevolence as well. Some instances of this evidence will be submitted in the next succeeding chapter.

CHAPTER V

BENEVOLENCE AND INTELLIGENT DESIGN

The recognition of a supreme benevolence in the world is to the normal mind irresistible. Every blade of grass, every flower, every living organism proclaims it. Whether commonly recognized or not, every department of science use exhibits it.

Reader, let us begin with your own involuntary testimony in the case, which is clear and positive.

You came into the world an absolute stranger; —speechless, helpless, ignorant, naked, without so much as ability to move from one place to another, however near.

What did you find upon arrival? Two competent guardians appointed to at once take charge of you, supplied with food of the only kind you could take, and in whom the flame of love for you had already been kindled, to insure the proper care of you until such time as you should be able to take care of yourself. Can you deny or forget such beneficence?

The atheist, accepting the gift, is blind to the giver. He travels a dusty, desert road, hot and thirsty. Coming upon a cooling spring he finds a golden cup in easy reach above the water. He soliloquizes, "My need (environment) produced the cup and the spring." Of course it did, for God knows the needs of His creatures and provides for them; and some human benefactor, knowing the need of the traveler, left the cup. But the fact that the spring and the cup were needed cannot eliminate the hand that provided them.

The animals are given means of defense or protection of some kind. When it is not means of destruction, it is by the power of escape,—sometimes by fleetness of limb, sometimes by mimicry of color of their surroundings. Sometimes where the color of the environment changes with the season the color of the animal changes with it, as in the case of some polar animals whose coats are white to match the snow during the winter, and some darker color at other seasons.

According to Dixon the harmless snake pliocerus elapsoides mimics the terrible and much feared elaps lemnicatur in color. (Human Side of Animals. Published by Frederick Stokes & Co.) This is evidently for the protection of the defenseless pliocerus.

The chameleon changes color to match its changing background. These animals do not make these changes themselves, but they are made for them by a benevolent Creator.

Who but Infinite Intelligence could construct and control a physiological system capable of acting in opposite directions as occasion may require? If food is taken that produces acid the bodily processes will produce alkali to counteract it; or if alkalinity, they produce acid to counteract this, and thus maintain the necessary balance of reaction in the system. This is but one of the many special agencies provided by an all-wise Creator for accomplishing His benevolent designs.

Who guides the migratory birds in their unerring course across the trackless wastes of air and land and sea to their certain goal, thousands of miles beyond their possible ken? And who sustains them?

Who guides the salmon after long and devious wanderings through the ocean's depths back to and up the one certain stream to place her eggs within the sacred keeping of her own homeside, and again, finally to die in the place of her birth?

Who instills within the mother's breast such ineffable love for her offspring as to be willing even just at its birth to die for it if necessary?

Only infinite benevolence associated with infinite power can account for these puzzling things.

Even throughout inanimate Nature we witness a well-defined plan pervaded with the sublimest benevolence toward organic life.

Take water, for instance. It is absolutely necessary to the maintenance of physical life, and it is the most abundant single material in Nature. Some of the properties of water show the beneficence of Nature in a remarkable degree.

Law of the Maximum Density of Water: This is a remarkable exception to an all but universal law, for a humane end. The law is that bodies expand with heat and contract with cold. Water obeys this law until it becomes chilled to 7.2 degrees C. above the freezing point, and then reversing the law it expands when further cooled. Were it not for this the ocean would freeze solid and never become liquid again, because the coldest water would continue to sink to the bottom until the whole ocean depth would be cooled to the freezing point, and then freeze. But instead, the water sinks until it is all at maximum density temperature (39.2 degrees F.) and when the surface is further chilled, becoming lighter, it remains at the surface, so that only a thin layer of water becomes colder before being protected by a covering of ice, when conduction becomes the only chance for further loss of heat. Again Infinite

Benevolence has provided that in the freezing process the ice expands and becomes lighter than water so that the ice floats at the surface.*

LATENT HEAT OF STEAM: In the opposite direction the protection provided is quite as effective. No matter how much heat is applied, water can never be made hotter than 212 degrees F. on the earth when open to the air. The reason is because at atmospheric pressure at this temperature the water becomes steam, and steam in forming absorbs an enormous amount of heat. We may have either or both water and steam at boiling temperature; and a pound of water at this temperature will require an amount of heat to convert it into steam with still the same temperature, that would raise the temperature of 735 pounds of water one degree Fahrenheit, or one pound of water 735 degrees. This amount of heat is taken up whether the vapor comes from boiling or ordinary evaporation of water. Thus the earth's surface is prevented from getting too hot, by evaporation of its moisture. And this process is reversed when the vapor is condensed, liberating all of the heat taken up; so that the cold that condenses this vapor also liberates a quantity of heat to counteract the cold and prevent the earth getting too cold. Thus it is seen heat produces cold, and cold produces heat, keeping the habitats of mankind at a comfortable mean of temperature.

SPECIFIC HEAT OF WATER: Again, water holds more heat, pound for pound, than any other material in nature. It holds 30 times as much as mercury. That is, the heat required to heat one pound of water to one degree will heat a pound of mercury to 30 degrees. The beneficence of this law lies in the fact that it requires the greatest amount of heat to make it too hot and the greatest amount of cold to make it too cold for man's (and the animal's) comfort.

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*Ten volumes of water become 11 of ice. Therefore it should be remembered when an iceberg is encountered, that ten times as much, is submerged as that above water.

And then, when the winter's cold threatens to freeze the earth and all in it solid, the benevolent hand of Nature spreads a protecting blanket of snow over it to keep it warm; and the seeds that are asleep in the bosom of the earth are able again to awake when the blanket is removed and spread a mantle of green where there was apparently hopeless desolation.

LATENT HEAT OF WATER: Consider here further the provision of the Creator for the realization of His benevolent design. The snow falling upon the warm earth would melt as fast as it fell, but for the fact that each snowflake in forming produced a certain definite amount of heat, and in melting it absorbs or makes latent the same amount, which cools the surface where it falls.

Even death itself is benign. "Except a corn of wheat fall into the ground and die, it abideth alone; but if it die it bringeth forth much fruit." The beautiful flowers, besides bedecking the highways and byways of Nature, often making the desert to smile, are prophecies of fruition, but it is only through their death that the fruit may come.

Chemistry brings her testimony to the benevolence of Nature. It is an unfailing law that acids and alkalis counteract and neutralize each other, and it would seem that nothing could be both acid and alkaline at the same time. Yet we live in an atmosphere beneficently constituted so as to neutralize either acid or alkali that might happen to be added to it, otherwise to our destruction.

Consider now the intricacies of Nature.

The writer has read, with the aid of a microscope, the entire Lord's Prayer contained in a space so minute that not even a speck could be seen upon the glass slide. Indeed, the owner of the slide was unable to locate the writing on it. And yet an atom is so small that even with the most powerful microscope ever made no one has ever been able to see one.

Consider the structure of this invisible unit of matter. Scientists claim to have recently discovered that the atom is composed of a nucleus around which a multitude of electrons revolve at inconceivable velocities, and that were the atom magnified to a diameter of one mile, then the nucleus would be about the size of a walnut.

There is scarcely a doubt that were the whole truth known, this infinitesimal nucleus would be found to possess still further intricacies of structure and co-ordination.

That anyone could even question the fact of an Infinite Intelligence back of such conditions seems past comprehension.

Yet the same intelligence is witnessed in the opposite direction. Scientists tell us with equal assurance that some of the stars are at distances from us that stagger the imagination in trying to grasp them.

A second is our smallest unit of time, and light travels at the speed of 186,000 miles a second,—seven times round the earth between the ticks of the clock. And yet some of the stars we see night after night are so far away that a signal flashed from one of them at the beginning of the Christian era—19 centuries ago—would not yet be half way on its journey to us.* Here we stand—the human family—between two infinities. Should we not stand with bared and bowed heads in the presence of such knowledge? Yet we are "made in the image and likeness" of that Intelligence which is capable of designing and organizing such a system! Do you ask for proof of this? You *have it* in the very fact of such knowledge, for who but Divinity and its likeness could discover such infinities?

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*According to a very recent report, astronomers have discovered a group of stars 110,000 light years distant from us; which means that light traveling at its enormous velocity takes 110,000 years to traverse the space between us and them. And many of these stars are found to be 10,000,000 times as bright as the sun.

CHAPTER VI

The Animals

"I am the voice of the voiceless;
Through me the dumb shall speak;
Till a deaf world's ear
Shall be made to hear
The wrongs of the wordless weak.

"The same force formed the sparrow
That fashioned man the king;
The God of the whole
Gave a spark of soul
To furred and feathered thing.

"And I am my brother's keeper,
And I will fight his fight,
And speak the word
For beast and bird
Till the world shall make things right."

—Ella Wheeler Wilcox.

In this chapter the author hopes to show that the character and attributes of the lower animals, even from the beginning justify his claim that they are simply the earlier forms of man himself and that there is no disparagement to man in recognizing his ascent from lower animals in the manner indicated, to-wit: through death and rebirth (or resurrection), for when they are understood, as they are fast becoming, there is nothing in them for man to be ashamed of, any more than there is reason for the adult to be ashamed of having once been a child.

The animals have for ages been misunderstood and condemned by man, who has maintained almost universally an all but impassable barrier between himself and them, by creating a well-merited distrust of him on the part of the animals. But recent investigations and studies made of both the individual and social life of many of the animals have opened the eyes and the heart of mankind toward them, as we find astounding similarities between their efforts and abilities and our own.

We have learned among other things concerning our lower brothers that they possess all the attributes of humanity, some of which they have in greater degree than we, the "lords of creation."

I will proceed to cite some well authenticated observations and experiences to prove this claim. But before doing so, I will suggest that my readers read the works of the well-known naturalist, Royal Dixon, entitled, "The Human Side of Animals," and "The Human Side of Birds," published by Frederick A. Stokes Company, 443 Fourth Ave., New York, since these cover the ground very well. What I will say on the subject may be considered supplemental to Mr. Dixon's admirable work in this direction.

Intellectually some of the lower animals—considering their lack of advantages—measure up pretty well alongside of man; and morally, some of them may be compared with him only to man's disadvantage.

That the animals frequently are capable of direct abstract reasoning can no longer be questioned. Hence there is no reason for discounting the animals' mentality by calling it instinct.

Mark Twain said instinct is petrified reason. This is not true. The animals, having devised the very best methods for accomplishing their purposes display a high class of mentality in making such methods permanent.

Some of the abstractions of the animals would indeed do credit to mankind.

I personally know a few dogs that are above many a man in intelligence, morals, and manners. I myself have witnessed exhibitions on the part of dogs and horses of pure deductive reasoning, and on the part at least of dogs, of altruism, sense of responsibility and propriety, and in fact, all the spiritual attributes of humanity, not even excepting veneration.

Here is an instance of pure reasoning on the part of a water spaniel named Joe, of Crescent City, California. There was in 1902 a low cypress hedge along the water front covering a board breakwater. Outside this was a beach covered in places with driftwood. Joe took great delight in running after and bringing a stick as long as anyone would throw it for him. The dog was so insistent on having the stick thrown that on one occasion, after having thrown it over the hedge many times, and becoming bored by his persistent appeal, I determined to end the game by throwing the stick on top of the hedge. To my great astonishment when Joe had looked carefully on both sides of the hedge without finding the stick he deliberately climbed up on the hedge and worked his way along until he found the stick. This was the first time it had been thrown there, and the dog evidently reasoned that since it was not on either side it *must be on top*.

It has been said that the animals only learn by accidentally doing the thing learned, but this is not true. Here is the case of a horse who, as quickly as any human could do it, planned a deception, and executed it as effectively, for a definite purpose, and his own advantage. I once led a horse to water, and after drinking, he laid down and rolled, accidentally jerking the halter strap from my hand, as is often done. He at once took advantage of his liberty and ran to the stable a hundred yards away. There was kept in the vestibule of the stable a tub of whey for the pigs, of which the horses were very fond. I felt sure he would run in and drink the whey until I arrived, and did start in, but my astonishment may be imagined when he turned from the whey only a few feet away, kicked up his heels and ran off, as I supposed, into the field, placing the stable between himself and me. I ran past the door fully expecting to see him speeding away into the field; but no horse could be seen anywhere. So I took up his tracks and followed them—to my further surprise, around the stable and into the door where he had passed in behind me. There he stood, drinking his fill of the whey, his ruse giving him much longer time at the tub than he would otherwise have had. It will be noted that this "lower animal" ignored an immediate advantage to obtain a deferred and greater one. If that does not prove mental action on the part of the horse I do not know what could.

The Scientific American some years ago gave an account of a mouse performing an engineering feat that would do credit to a man. The mouse having fallen into a deep round hole dug a spiral incline around the perpendicular sides of the hole from bottom to top, and thus delivered himself from death from starvation.

A captain of a steamer on the Great Lakes told me he was once passing through the Soo canal, when he observed a little dog trying to play with a big one. The big dog treated him with silent contempt for a while, but growing weary of his attentions, took him up by the skin of his back and dropped him over into the canal. This dog surely disposed of a nuisance as quickly and effectually as any human could have done it.

Here is an unusual exhibition of initiative that occurred in Ocala, Florida, about the year 1886. A gentleman was in the habit of having his dog bring his food to his store wrapped in a newspaper. On one occasion when it proved to be insufficient, the dog, on his own initiative, took the paper back to the kitchen for more food and laid it at the cook's feet.

Here are four examples taken from "The Human Side of Animals" by Royal Dixon, showing that animals do use their minds in meeting their needs in emergencies and at other times.

(1) "A farmer in Michigan discovered one morning, just after a flood, that all his potato sacks, which had been hung on a back fence to dry, had suddenly disappeared. A few days later he found them in a nearby beavers' colony, used in rebuilding their dam, which had suddenly overflowed. The beavers wasted no time, when they discovered their danger, in meeting the emergency by using the sacks to prevent the destruction of their home."

(2) "I knew of a tame ape in Chicago that learned to swing from the end of a clothes line and seemed to enjoy it very much. The line was just the right length and properly hung so as to allow the ape to swing out from a kitchen window and touch the ground. Just for fun, some one cut a piece from the line so that he could not reach the ground; immediately the ape hunted another piece of cord, tying it to the end of his line so as to increase its length, and much to his delight, continued to swing on the line."

(3) "The *toxotes jaculator,* which lives in the rivers of India, and feeds upon insects, cannot afford to wait until the insects which thrive upon the leaves of aquatic plants fall into the water. So as he cannot leap high enough to catch them, he fills his mouth with water and squirts it at an insect with such aim and force that he rarely fails to knock the insect into the water where he can easily catch it."

(4) "The Icelandic mice have probably the most curious methods of traveling of all migratory animals. Dr. Henderson, an authority on Iceland, not only verifies the fact himself, but gives the names of many prominent investigators who have

seen the mice crossing small rivers and streams on thin pieces of dry board, dragging them to the water, launching them, and then going aboard their little rafts. They then turn their heads to the center, and their tails, which hang in the water, are used as paddles and rudders until they reach the destined shore."

That all animals use their minds and act quickly according to the exigencies of the case is clearly proven by the fact that in their fights they decide instantly on the best hold to take on their antagonist, and will change their hold the instant a better one appears. They know the most vital points of attack and aim at them.

The loyalty and fidelity of the dog have become proverbial. Oh, that mankind as a whole could rise to the level of the dog in this respect!

Shakespeare says, "Sharper than a serpent's tooth it is, to have a thankless child." Many parents have doubtless felt the sting of this truth. Of course the dog owes but small obligation to its mother for support and care and none at all to its father; but who can question for a moment the gratitude of a dog to his benefactor?

In Lakeland, Florida, a little dog who was a professional high diver, contracted a troublesome cough in the service of his master, so he was sold to a man who left little Dewey—for that was his name—an outcast without support, and thrown on his own resources. Dewey secured his sustenance by foraging in the backyards of the town but would always beat a hasty retreat upon the approach of any human. I soon gained his confidence and friendship by feeding and petting him, and man never received from man such devotion and loyalty as I received from this lower (?) animal. When it became necessary for me to go away for two days my little friend tried his best to go with me into the train, but being prevented, ran after the train until his breath gave out. When walking on the streets he acted as my body-guard, invariably walking between other dogs and me. A growl would always warn such dogs of their danger in approaching his master too closely, and on one occasion in my behalf he attacked a dog three times his own size, and the latter was only prevented from killing my little protector by being promptly kicked off him.

One night I lay sick on my bed in the back of a drug store with my faithful collie watching. The clerks had some visitors and they were talking and laughing boisterously while business lulled. Suffering with headache I called as loudly as I could to try and stop the noise but they could not hear me; whereupon without any suggestion from anyone the dog ran to them and barked fiercely at them until they investigated and learned the cause of his action.

Here is a deserved tribute to the dog by a prominent statesman:

(From a speech by Senator Vest of Missouri.)

"Gentlemen of the Jury—The best friend a man has in the world may turn against him, and become his enemy. His son or daughter that he has reared with loving care may prove ungrateful. Those who are nearest and dearest to us, those whom we trust with our happiness and our good name, may become traitors to their faith. The money that a man has he may lose. It flies away from him, perhaps when he needs it most. A man's reputation may be sacrificed in a moment of ill-considered action. The people who are prone to fall on their knees to do us honor when success is with us, may be the first to throw the stone of malice when failure settles its cloud upon our heads.

"The one absolutely unselfish friend that man can have in this selfish world, the one that never deserts him, the one that never proves ungrateful or treacherous, is his dog. A man's dog stands by him in prosperity and in poverty, in health and in sickness. He will sleep on the cold ground, where the wintry winds blow and the snow drives fiercely, if only he may be near his master's side. He will kiss the hand that has no food to offer; he will lick the wounds and sores that come in encounter with the roughness of the world. He guards the sleep of his pauper master as if he were a prince. When all other friends desert he remains. When riches take wings, and reputation falls to pieces, he is as constant in his love as the sun in its journeys through the heavens.

"If fortune drives the master forth an outcast in the world, friendless and homeless, the faithful dog asks no higher privilege than that of accompanying him, to guard him against danger, to fight against his enemies. And when the last scene of all comes, and death takes his master in its embrace, and his body is laid away in the cold ground, no matter if all other friends pursue their way, there by the graveside will the noble dog be found, his head between his paws, his eyes sad, but open in alert watchfulness, faithful and true even in death."

That the animals in general understand the meaning of much more of our language than is commonly believed, there is plenty of evidence to show. Here are several instances:

My son and I while living on a farm in Florida were in the habit of driving a very intelligent horse, "Redboy," to a stock range every Saturday to look after some cattle pastured there, and always when returning in the afternoon would stop and take a swim in a stream we had to cross. But we always drove through the stream and hitched Redboy outside the road to a certain tree on the homeward side. One morning, however, my son said, "Father, let's take our swim this morning instead of this afternoon." We then forgot all about this, but as soon as we were approaching the tree mentioned, the horse of his own accord turned out there to be hitched.

Cats, though seemingly careless in respect to our conversation, understand much of what we say. My brother-in-law living a block away and across two streets from us went away with his family for an extended summer absence, but before leaving our sister asked us to go over every day and look after the kittens which were born but a few days before. The family left about 4 P. M. and some time during the night the mother cat brought all her kittens to our home and had placed them under our house. In due time our brother's family returned late one afternoon. While at breakfast the next morning we saw this mother cat going back to their home with all her kittens following her.

Mrs. S. remembers when their cat early one morning had brought her kittens from the barn loft to the back porch, after their eyes were opened, and her grandmother seeing them there remarked to "Grandpa," "After breakfast you must take those kittens out and drown them all." After breakfast not a kitten was there, for their mother had taken them all back to the barn loft.

In my own household we have an Irish terrier who is as human in every way except form and speech as any person can be.

We had two operations of the same kind performed on Patsey by a doctor in which several stitches had to be taken. With the second operation she was taken to the surgeon several times for examination. The next to last time the doctor told us to bring her the next morning and he would take the stitches out. The next day to the surprise of all, it was found that the little dog must have understood what was said, for she had taken out the stitches herself.

After Patsey had eaten her breakfast one morning she came and begged for something more. I told her several times, "Go bring your plate," and pointed to the plate. She could not handle the plate very well, but actually took hold of it and dragged it to me. The next morning

I tested her again in this way but she was unsuccessful this time, so I told her, "Go in the pantry and get 'Mother' (our daughter) to give you a paper plate." She went at once, and "Mother" hearing what I had said handed her the paper plate, which she brought straight to me. I took the plate from her, put a little piece of meat in the center and handed it to her. Twice she tried to take the meat from the plate, but I prevented her, telling her all the time to "take the plate." The third time she took the plate, carried it to her rug and set it down. After she had eaten the meat I told her to bring the plate and she obeyed at once. Upon placing a piece of meat in it she did not attempt to touch the meat until she had carried the plate to her rug.

Only a few days ago (August 25, 1922, to be exact) she was riding with Mrs. S. and our daughter in the automobile in which the front and rear seats are open to each other. Our daughter, who is a fine driver, had always done the driving; but this time it was decided that her mother should learn to drive the car. Just as soon as Mrs. S. got to the wheel Patsey jumped down from the rear seat where she had been quietly riding, came forward crouching down and crying pleadingly, looking up into the face of one, then the other, trembling all the while. Patsey evidently realized the danger of riding with an inexperienced driver. It is by no means improbable that she heard, understood and remembered a conversation in her presence a few days previously when it was proposed that Mrs. S. learn to drive the car, and I said jokingly, "I will never be willing to ride in the car while she drives it."

That dogs and some other animals exhibit a fine quality of altruism is attested by many observations.

A young gorilla is reported in Current Opinion for September, 1922, to have shown this virtue, and also a grasp of the fitness of things. When anyone looked out of a high window he would push or pull such person away, presumably to prevent his falling out of the window. Again, when prevented from getting in a lady's lap for fear of soiling her dress, after having a cry like any human child, on his own initiative he got a newspaper, and spreading it in her lap, climbed up.

Patsey exhibits this trait in a very high degree. She has a way of sitting up on her haunches and panting, while she keeps her ears moving and looking up into one's face if she has something serious to tell. Mrs. S. had a lady friend who about every two weeks would come in the early afternoon for a visit and invariably remained till ten o'clock. But one day Mrs. S. felt indisposed and lay on the lounge much of the day. The friend came that day, and Patsey greeted her as cordially as ever, but soon after dinner she went to the lady and performed her expressive "stunt," whereupon the visitor, knowing Patsey well, said, "Why, Patsey, do you want me to go?" Understanding Patsey's meaning she went at once.

Mr. E. (our son-in-law) once locked Patsey out of the bathroom while he was taking a bath. Upon emerging from the bathroom he found she had brought both his slippers and was waiting at the door with them.

Our next door neighbor has a French poodle whom Patsey does not like. But she saw the little dog in the middle of the street one day, and knowing its danger of being killed by a passing automobile, ran with all speed to Mrs. M. in the back part of their house and made known to her that something was wrong; then followed by Mrs. M. she ran back and right to "Cutie" in the middle of the street. Another day "Cutie" was screaming frantically and Patsey ran over to see what was the matter. "Cutie" was getting her bath when Mrs. M. left her in the tub to answer the door bell. Patsey seeing "Cutie" in the tub of water with no one present and doubtless believing her in danger, ran home to "Mother" and urged her to go over there. Upon reaching "Cutie" she saw what Patsey tried to tell her.

I have tested this little "human-minded" dog in various ways, and have seen her tested inadvertently many times, and some of the things that she has done—all without special training—would be unbelievable, but I can vouch for everything written here about her. She smothers her dog instincts very readily and seems sometimes to forget them.

She is so enthusiastic a hunter that on one occasion she jumped out of our automobile while going at twenty miles an hour to catch a ground squirrel she saw by the roadside; and she seems almost crazy to get at rats or other small game, killing them instantly. Yet a neighbor's rabbit one day got into our yard and Patsey scented it under a pile of lumber. Believing it to be a rat I routed it out and barely rescued it in time. We took it into the house and putting it on the floor simply told her, "Now, Patsey, don't you hurt this rabbit." In a few minutes she was following the rabbit about the room and just as soon as she could come near enough she stroked it tenderly with her tongue, and pretty soon they were close friends.

On another occasion we brought a kitten about one quarter grown to our home, and as Patsey delighted in chasing cats she was anxious to get at this one; and the cat was equally anxious to get out of her company. But I held the cat in my hands allowing the dog to come gradually nearer and nearer until I taught them that they were not enemies. At last it was safe to let the cat loose, and it at once made sure of its safety by getting under the nearest chair. Patsey at first carefully avoided abrupt approaches, and in a few days they were the best of friends, romping and playing as two kittens or two puppies will do. They were inseparable until the cat was sent away for the canary's safety.

In the matter of manners little Patsey could instruct many a human. She never refuses to receive anything given her, even though it be something she dislikes. She is well known and loved in the neighborhood and the clerks and storekeepers frequently give her candy. She was once given peppermint candy, which she detests; but she took it and upon reaching home, buried it.

If one of the ladies is in the sitting room taking her ease while the other is at work in the kitchen she will invariably come and push the idle one with her nose, and if this will not move her she will sit up on her haunches and plead with her till she goes to the assistance of the other. She will do the same thing if some of the family remain in the sitting room while another plays the piano in the parlor. They must go and listen to the music to satisfy her ideas of politeness.

Patsey was one day occupying a chair, as she often did, and as soon as I came into the room she jumped down, as if to give me the seat, no one having said a word or in any way suggesting it.

March 13, 1920. This morning Patsey came running to Mrs. S. and our daughter quite excitedly, and tried to tell them something. They followed her back to the sleeping room to see what was the matter when Patsey showed them the canary, who was enjoying a short freedom, and had got into Patsey's sleeping box. As soon as the bird was removed, she took from the box a puppy cake and carried it into the next room for safe keeping. Evidently her object in giving the alarm was to save her own property without frightening the bird. On this same date Patsey was given a bone, but the rug on which she was allowed to eat was in the back yard, so still holding the bone she looked up at Mrs. E. who brought in the rug, while Patsey stood holding the bone until she returned.

She recognizes articles of value wherever found. Once while taking a walk with her mistress, seeing a lady's back comb lying on the pavement, she picked up and brought it home without anyone noticing it till they reached home.

She is generally trustworthy, but I was taking my breakfast alone one morning and Patsey was begging me for meat, in her accustomed way, when our daughter came by and said, "Patsey, don't you beg daddy any more! Now get up in this chair." She obeyed instantly, as she always does, but as soon as Mrs. E. left the room Patsey jumped down from the chair, went to the door and watched her until she turned out of sight; then she came straight to me and renewed her begging.

Patsey's perceptive faculties are sharper than those of any human. This was clearly shown on the following occasion: I was preparing to take a train for another city, and Mrs. E. was getting ready in the next room to drive me to the station. Patsey lay on my bed apparently asleep,—the door between the rooms being closed. But she could tell by the sounds in the next room that Mrs. E's. movements meant a trip in the car somewhere, and she suddenly jumped to the floor and rushed excitedly to the door, crying for admittance. It is a fact that all dogs dearly love to ride in an automobile, and this was Patsey's object in going to the other room.

Affection is strong in Patsey as in all dogs.

Mr. and Mrs. E. left on their two weeks' vacation, and Patsey showed great distress the first day and night. She eschewed her box and slept on their bed. The second night she took one of "Mother's" slippers on the bed and used it as her pillow. The third night she took the other slipper up on the bed with her. Later Mrs. S. said, "Patsey, you must not sleep on the bed any more; you muss it all up." So Patsey took both slippers into her box to sleep with.

At another time when they took their vacation Patsey being more used to being left, slept in her box the first night. The next she didn't want to go into their room at all, but when made to go, the door still remaining open, she took an old sweater from her box, and dragging it into the front room, lay down on it, and slept so every night till their return. It was too lonely in the vacant sleeping room.

Dogs exhibit a sense of responsibility.

Our daughter usually gave Patsey something to bring into the house when they came in, but on one occasion when she had nothing else she handed her the hand-bag. Just then a neighbor called her to the fence and they talked about ten minutes. After going into the house and forgetting about the hand-bag someone called at the door with something for sale. She looked for her purse, and then remembered it was in the hand-bag which she had given to the dog. Patsey was lying on the floor, quite contentedly, when our daughter demanded, "Patsey, where's my hand-bag? Go and get my hand-bag." She got up and seeming to think a moment, went at once to where she had buried it in the yard and dug it up. She then tried to free it from adhering earth.

This is not the only instance we know of Patsey's thinking in order to refresh her memory. Whenever we say, "Patsey, go get your ball," she will stop and think, and generally go right to where she last left it and bring it.

Mrs. E. took Patsey to market one day, as she was wont to do; but this time she said, "Give me a piece of liver for Patsey," and then said to her, "This is for you." Upon reaching home she handed Patsey the package of liver expecting her to deliver it in the kitchen as she had many times done with other packages of meat; but instead of doing this she took it directly to her box and was eating it when discovered.

Members of my family knew a dog that was sent at noon every day to carry a person's lunch. One day another dog attacked him, with the object perhaps of capturing the lunch. But this dog put down the lunch container, and after giving his attacker a severe thrashing picked up the lunch and proceeded to deliver it.

Many animals are deeply affected by man's music. A military horse has his enthusiasm fired by strains of martial music; and as is well known, some particular kind of music seems to stir the fountain of feeling in some dogs.

A friend of ours has a dog who listens with interest to most kinds of music played on the Victrola, but the moment "jazz" music is started she howls as if in great distress. If the dog is missing, the beginning of this kind of music is the signal for her speedy return if anywhere in hearing.

Members of my own family tell of a black snake, or "racer," some years ago, who had a favorite resting place among some vines at the end of their porch; and whenever the piano was played, if the snake was in hearing he would come into the house and into the parlor, taking up a position back of the stool of the player, where he would remain listening until someone began to move about in the room. This behavior on the part of the snake was observed many times.

Our knowledge of wild animal life is being rapidly extended and some things we have long known of them are becoming better understood as we study them. Some of their institutions could serve as models for our own.

Who has not seen a *cloud* of birds rise as one bird from the ground in close formation, circle about the heavens, turning sharply but in unison to right or to left, then up, then down again with perfect order. Every individual turns at the same time and in the same direction without the least confusion whatever. What marvelous organization and co-operation!

If our human institutions—the state, the church, the industries—could even approach it in efficiency, what tremendous results we could achieve!

Our increasing knowledge of animal life is changing the old beliefs concerning them into a widespread belief that all animal life is as indestructible as that of man.

The Rev. Henry Ward Beecher, who for nearly half a century occupied a distinguished position among the late clergy of America, in the course of an eloquent sermon on "Men and Other Animals," declared:

> "Why, if horses and dogs have not souls to be saved, what in heaven's name will become of their masters? For fidelity and devotion, for love and loyalty, many a two-legged animal is far below the dog and the horse. Happy would it be for thousands of people if they could stand at last before the judgment seat of Christ and truthfully say: 'I have loved as truly, I have lived as decently, as my dog.' And yet we speak of the dog as being 'only a brute.'"

In the matter of the arts, let us see how man qualifies in the presence of the animals. The birds were one of the early creations and therefore not supposed to be much advanced mentally, yet while man's domicile was a natural cave, birds were already building their homes with amazing display of mechanical skill and decorative taste. The saurians were also an early creation, yet we find their modern representative—the alligator—building a true incubator in which her eggs are hatched,—a practice which doubtless began with the earliest saurians, for their being cold blooded animals necessitated the use of external sources of heat for this purpose. The alligator of today will construct her nest on scientific principles designed for producing artificial heat of exactly the right temperature, and maintaining it uninterruptedly for the necessary period. Several birds also build incubators for their eggs so that they are hatched by artificial heat.

Mr. Royal Dixon tells of the Mallee bird of Australia which builds its nest of gravel and vegetable matter mixed together in such a way that the heat of decaying vegetable matter hatches the eggs. Mr. Dixon says of the birds:

> "They are engineers of great ability and ingenuity, and seem to know just how and in what quantities to mix whatever materials the region affords. That they understand in some measure the natural principles which they employ is shown by the intelligent care they take in the choice of vegetation and, in the scrupulous removal of all decayed matter of the previous year." ("The Human Side of Birds," published by Frederick Stokes Co., New York.)

But man only yesterday began to build incubators, having required all these ages to simply adopt the saurian and bird idea.

And the primitive adobe house ("mortar made of slime" of the Bible) was antedated by ages by the elegant houses of the mud-dauber— some of one story and others of several. Doubtless man got the idea from this lowly insect. The dauber also practices an art which man, with his boasted superiority has never been able to imitate. When this little artist builds a room in her house she fills it with food for her prospective offspring, after laying an egg in the rear end of the room. The food consists of certain kinds of spiders which she inoculates with just enough of the poison of her sting to paralyze them, still leaving the spark of life in them, which perfectly preserves them apparently indefinitely. She attaches her egg to the first spider placed in the cell in such a way that as growth proceeds the mouth of the youngster reaches one spider after another upon which it feeds. Man's food preservatives are too often poisonous to the adult system, yet here are the *infantile* daubers thriving on the preserved food its mother provided in advance to bring it to maturity.

Man also got the idea of the mausoleum from the swallow, which according to Dixon seals up its cave with mud, should one of the family die in it, thus making of it a sealed sepulchre.

Man learned paper-making from the wasp family; and of hinges for his doors from the trap-door spider. This skillful little builder drills a hole in the earth to fit the diameter of his body and lines it with silk of his own manufacture, then he constructs a hard valve seat for his door to fit snugly upon. He then, with consummate skill, constructs a door to exactly fit into the depressed opening so that when closed the door is flush with the top of the ground and the prepared socket. This door is strongly but beautifully hinged to one side of the opening, which side had to be made straight to accommodate the hinge. Meanwhile he does not forget outside enemies, for on the underside of the lid near the edge opposite the hinge he has made two hand holds so that as soon as the approach of anything is heard he rushes up and firmly grasps the lid so that it requires force to open it.

The honey bee has for ages built her honey cells on mathematical principles providing the greatest economy of space and comb material, which man has but comparatively recently, and only by the difficult and severe method of the calculus, been able to attain.

Man learned agriculture, animal husbandry and the domestication of useful animals from the ant; for this humble insect is known to encourage the growth of certain plants by destroying all others in their fields; and they also care for the aphis for the saccharine substance it secretes and carry the young of the aphis along with their own when it is found desirable to remove to new quarters. The United States Department of Agriculture finds it impossible to control the citrus mealy bug by means of its parasite enemies until they first destroy the Argentine ant which protects it from its natural enemies for the honey-dew secreted by the mealy bug.

Dairying was also learned from the ant, for they milk the aphis as we do the cow.

From the beaver, man learned to build dams across streams, to raise the water level for special purposes.

The firefly and the glowworm have been for ages teaching Man the art of scientific lighting without heat, but dull man is so slow he has not yet learned.

In the matter of character, all dogs are better than many men, and many dogs are the equal of the best men. Everybody knows this to be true; and it is no wonder we dislike a comparison. There are a great many things that men commonly do that a dog would not stoop to. Every normal mind will intuitively recall some instance of this. The same applies to all the other animals. Man, —arrogant egotist—received many of his best ideas from the lower animals, and then proudly calls himself "The lord of creation," refusing to give credit where it is justly due.

God of a million million spheres
  That swim and circle, drift and dream
Down through a million million years
  In one predestined perfect scheme.
Our feet are slow and blind our eyes,
  We are an all benighted race;
Thou hast decreed that we shall rise,
  But slow the pace — how slow the pace!

God of a million million men
  Of unborn legions yet to be,
God of the hordes that came and then
  Were swept away by thy decree,
Our charts are dim and poor the light,
  Thy guidance give that we may find
The course ordained and follow right,
  For we are blind, for we are blind.

Black as the shade that midnight flings
  Are gloom-beshrouded minds of men;
Thick is the mud of lust that clings—
  The mire of that primeval fen;
And Murder lifts her snaky hands
  While Justice hides her pallid face,
And flees the strife-accursed lands
  To our disgrace, to our disgrace.

God of the yokel, serf and slave,
  Thou God of all our helpless breed;
God of the Jew who sought to save
  The human beast from beastly greed,
We pray you in this hour of stress
  A lamp to lead us through the night,
We pray you in our helplessness
  A better light, a better light.

CARLYLE C. McINTYRE.

THE END

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